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# THE PRESENT STATUS OF AGRICULTURAL EDUCATION IN PUBLIC SECONDARY SCHOOLS OF THE UNITED STATES

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C. H. ROBISON

Montclair State Normal School, Upper Montclair, New Jersey

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The contrast between the present condition of agricultural instruction of secondary-school grade and its status so recently as three years ago is no less a matter of extent than of general efficiency. The inquirer at that time would have had trouble in even locating the few schools that were groping their way out of the traditional gloom in an attempt to effect some adjustment of their work to the rural community needs. The popular magazines still "discover" one of these schools occasionally. Three years ago many state departments of public instruction and agricultural colleges were unaware of most or all of the high schools in their own states attempting to introduce agricultural work. Where few of the colleges in 1908 were able to furnish more than one or two, if any, names of graduates who had gone from the agricultural courses into teaching, a large number now maintain departments of education and extension work. Over eleven hundred students were registered in 1909 for work in nature-study and agriculture in twenty summer schools conducted by state universities and agricultural colleges.

In a numerical way the rapid strides made are well shown by the following estimates of the number of public high schools, both general and special, teaching agriculture. During the school year 1906-7 the number probably did not exceed seventy-five or eighty, even including those high schools maintaining training classes in which agriculture was taught. In 1907-8 there were probably between two hundred and forty and two hundred and fifty. In 1908-9 the total must have risen into the neighborhood of five hundred, while it is not unreasonable

to suppose that the thousand mark was nearly if not quite reached in the past academic year. Unwarranted claims have occasionally been made for individual states and for the country at large which materially shrink when checked up with detailed information from individual principals regarding the amount and character of the recitation and laboratory work. Some reports show that the subject is not taught at all; others, that it is taught merely as incidental to some other science; and many schools evidently teach it as mere bookwork, without even window-sill or tomato-can experiments.

Perhaps a better index of real progress is the growth in the number of schools having an agricultural course of two or more years. In 1906-7 there were about fifteen such schools, mostly of the special sort. Since then the secondary schools giving this more extensive work have differentiated into three rather distinct types: first, the public high schools and a very few academies functioning as local high schools, all depending entirely on local support; second, schools receiving state aid for their agricultural departments but offering general high-school courses; third, schools supported wholly or in part by the state, with curricula centering around the industrial work. The figures given below for the year 1909-10 follow this classification and probably include most of the schools properly belonging here.

1. Over thirty are high schools or academies depending on local support or patronage. These are distributed among fifteen states, the largest number in one state, seven, being in Michigan, with California and Tennessee not far behind. Eight or nine are county high schools, as many are village schools, while the others are township high schools or academies.

2. At least forty-six schools receive state aid for agriculture, but also offer general high-school work. These usually give more or less classical work, but sometimes call themselves "agricultural high schools." The schools of this second class are found mostly in five states: nine in Alabama, seven in Louisiana, six in Mississippi, ten in Minnesota, and ten in Virginia. Those in Alabama are maintained for congressional districts,

those in Louisiana and Mississippi for counties, and those in Minnesota for cities and villages. Some of the Louisiana schools are probably developing into schools of a more strictly agricultural type than are others.

3. The strictly agricultural secondary schools, existing apart from the agricultural colleges and more or less independent of them, number between forty-five and fifty, according to how many of those scheduled to start this year are in actual operation. Of these, Georgia has eleven congressional-district schools; Michigan has one county school, and Wisconsin has seven; Oklahoma has a school in each of her five judicial districts, about the size of her congressional districts, and one in the "pan-handle"; while the other schools, mostly "state agricultural high schools," do not minister to any definite districts. Arkansas is opening a school in each of the four quarters of the state. These divisions are, of course, larger than her seven congressional districts.

Information concerning the rural or semi-rural high schools offering agriculture has not been generally accessible and has been difficult to gather. These schools offering courses of one year or less now probably number between eight and nine hundred. Complete data on the distribution of most of the high schools with agricultural courses in 1908-9 show that somewhat less than one-half were maintained by villages of less than 4,000 population, that about one-fourth were township high schools, and that the rest were almost equally divided between counties and cities with a population of 4,000 or over. Between two-thirds and three-fourths of the schools were in the North Central states, and almost a fourth in the South Central states, with a very sparse distribution among the Atlantic coast states, both north and south, and in the far West. By far the largest number of these schools were in Nebraska, Ohio, and Missouri.

The term "agricultural high school" is no safer guide to the real nature of many of the schools using it than are the titles "college" and "university" in the case of many institutions of dubious character using them. The nearest approach to

an official pronouncement is the stand taken by the American Association of Agricultural Colleges and Experiment Stations, that an agricultural high school should be distinctively of secondary-school grade, including no grammar grades, that it should require all students to spend at least one-fourth of the entire time on agriculture (or home economics for girls), and that it should make definite provision for practice in farm operations. Several institutions styled agricultural high schools have required Latin of all students and have offered agriculture as an elective. Certain district agricultural schools of Alabama have recently enrolled more students in the elocution, music, and commercial departments than in agriculture. A Mississippi county agricultural school organized a little over a year ago listed Greek among the second- and third-year studies in its prospectus. The Virginia schools are really three-fold, with definitely separated agricultural, college preparatory, and teachers' training departments; but little uniformity has been observed in the designations adopted in the school catalogues. On the other hand, many public high schools maintained by local communities have experimental plots, orchards, and greenhouses, but advertise these advantages without calling themselves agricultural high schools, and without seeming to belittle the fact that they offer general courses. Notable examples are the Town of Petersham high school in Massachusetts, the John Swaney school in Illinois, and the Beaverhead county high school in Montana.

The county is the largest unit supporting the general or non-special high school. It is the smallest unit supporting the special school. The other agricultural schools are maintained by direct state appropriations or by the division of certain revenues, such as tag and inspection fees. The congressional district is not a political division for school support but for the determination of the number and distribution of the schools. As a rule only the county and village in which the school was located contributed any considerable amount to the initial cost of establishment. The special schools in the North exist near well-established general high schools. Those in the South, as

a rule, do not. The Alabama schools, the oldest of the special schools, have for many years functioned as the general high schools for their respective towns and counties more than as agricultural schools. In Virginia, an established institution in the congressional district has usually been designated to receive the funds appropriated to aid the agricultural and teachers' training departments. The governing boards of the larger district agricultural schools have been appointed by the governor, while the county boards have always been chosen by the electors or county school boards.

It is difficult to foresee whether the county or the larger district will finally prove the more popular political unit for special schools. Wisconsin and Alabama were the pioneers in the two experiments. The example of the former has been followed by Maryland, Michigan, Louisiana, and Mississippi; that of the latter by Arkansas, Georgia, and Oklahoma, the Virginia schools hardly falling in this category. State-aided schools for whites, not ministering to particular sections and not attached to agricultural colleges, exist in California, Georgia, Massachusetts, Minnesota, and New York. Idaho plans the establishment of two schools. A large majority of the state normal schools are also giving more or less instruction in agriculture.

Probably a majority of the men of prominence who have participated in recent discussions have favored the larger unit on the ground that counties have not the means to furnish such an expensive plant as the special school should possess, and also that the enrolment would not justify its existence. We should not, however, overlook the important factors of relative wealth and density of population (by which in the two Southern states is to be understood the white population). The average enrolment does not seem to differ greatly between the two groups—no more than within each group. It must be remembered also that the congressional-district schools often have no competing general high school. The Oklahoma schools exceed the others in attendance and equal those of Wisconsin in average number of industrial instructors, but do not equal them in the pro-

portion of the students' time devoted to industrial work. The value of the plant of the northern county schools, ranging from \$40,000 to \$75,000, equals that of many of the Georgia properties, and far exceeds the value of most of those in Alabama.

While two or three counties might jointly support and patronize the Wisconsin schools without necessitating much enlargement of the plant except as to dormitories, a much larger proportion of the students would have to live away from home. A year ago Georgia headed the list with 77 per cent of students living away from home. The lowest percentages were in Michigan, 20 per cent, where a large majority seem to be girls from Menominee taking domestic science, and in Alabama, 50 per cent, where the schools also serve as local high schools or finishing schools.

The special agricultural schools of Michigan, Minnesota, and Wisconsin have a two-year course, presupposing an eight-grade common-school course, although no pretense is made of rigidly adhering to this standard in the case of the older students. Nearly all the "short-course" students are past school age. The academic work ranges from no work unrelated to agriculture except civics and United States history, in the school at Menominee, Michigan, to ten periods a week in history, English, and mathematics, in the Wisconsin schools. Even here the agricultural work takes 71 per cent of the total time of recitations and practicums, showing how intensely vocational are the activities of this group of schools. The course in the district schools of Alabama, Georgia, and Oklahoma is one year longer, although the inclusion, by the schools of the Southern states, of the eighth grade, consisting largely of the common branches, makes it seem to be a four-year course. About one-third of the district schools offer a general course including ancient languages. The Alabama students spend one-fifth of the classroom time on agriculture. Including farm exercises, the industrial work employs over one-fourth of their time. One-third of the classwork in the Georgia schools is agricultural. Including laboratory, shopwork, and field experimenta-

tion, we account for two-thirds of the total time in the printed schedule. Each student must give in addition nine hours of labor a week. The industrial work in the Oklahoma course of study seems to provide for a little more than half of the students' time. The county schools of Louisiana and Mississippi are still so largely in the formative state that they cannot easily be included in these comparisons. The work of instruction by no means measures the scope of the usefulness of the schools. Institutes, conventions, individual advice, and the testing of seeds, milk, and fertilizers are some of the many useful services to the community.

In many respects the study of the agricultural movement in the general high schools, especially those of non-urban communities, is even more interesting than is that of the special, or technical, schools of agriculture. The closeness of the former to the home life of the pupil and patron, and the limitations under which the latter must always work, give a certain value to the work of the public high school independent of the disparity between the size and completeness of the plant in the two cases.

The United States Department of Agriculture received reports for the year ending June 30, 1909, from 309 high schools having a total enrolment of 54,700, and 9,500 in the agriculture classes. This subject was taught for but one year, or a part of a year, in 213 of these schools. The facts given below are based on my own returns from 188 of the smaller schools, enrolling 15,243 pupils and serving a population of over half a million. Over one-third of the pupils were from farm houses, and about one-fourth were studying agriculture.

A number of persons prominent in official and university circles have strongly maintained that agriculture should be placed in the third or fourth year, after the other sciences. In over half of the 145 schools offering agriculture for one year or less, and furnishing comparable data, the pupils may or must take the subject in the first year, and they may or must take it during the second year in nearly all the other schools. In only 69 schools are first-year pupils excluded. The subject is



required or optional after the second year in 49 schools, but in only eight schools are no students permitted to take agriculture until the third year. In many schools giving the work but one year it is open to students of two consecutive classes, due to a doubling up of classes to economize teaching force.

If such a course of a year or half a year be given in the later years it may be made rather intensive and technical with a strong vocational trend. It may also be made a synthetic study with a distinct cultural aim. But the figures just cited indicate that in prevailing practice the subject is placed in the lower part of the high-school course, where no such preliminary preparation can be given by the sciences in general. It must of necessity therefore take on more of the nature of an introduction to science—a term which has many advantages over that of “elementary science.” In this rôle agriculture bids fair to compete successfully with physical geography, which has not entirely succeeded in meeting the expectations raised by its advocates. Those dissatisfied with physical geography, as represented by most texts, feel that it furnishes at best a forced introduction to anything but geology and a very limited set of physical principles. Elementary agriculture makes a very definite application of the same and other physical principles to the pupils’ environment, introduces much of the chemistry of everyday affairs, and takes up a few topics of animal life as intensively as the most exacting course in high-school zoölogy. It does not blush at lifting bodily no less important physiographic topics than the nature and origin of soils, and it threatens to take over most of the half-year botany course of the lower high-school grades except plant analysis. Elementary agriculture does not hesitate to borrow from the various sciences, but makes the direct connection with life that many of these, because of the fatuous shortsightedness of their sponsors, have failed to make. Agriculture in the lower years of the general high school can hardly hope to furnish the degree of vocational training that it might in the corresponding grade of a special school. It may not possess either the technical or cultural value that it would if given in the more advanced years. For a

course introductory to science in general possibly the very name agriculture is not the most desirable, but it does furnish a thread of continuity which the proponents of physical geography hold with some justice to be lacking in most proposed courses in so-called elementary science.

The number of weeks devoted to agriculture in 171 schools offering it for one year or less and reporting on this point varied from 6 to 40, with a strong central tendency at 18, the number of weeks in 82 schools. In some respects this leaning to the half-year course is unfortunate, because on the observational side agriculture is essentially a seasonal study and should extend through the entire school year, even if the total number of recitations remains the same. The number of minutes per week in 141 schools, including some with larger courses, varied from 20 to 600, with a strong mode at 200, that is, five recitations of 40 minutes each. This makes no provision in school hours for additional laboratory work, and probably includes no double periods. Some other investigations of the time given the standard sciences in schools of the same type indicate that none of the sciences fare much better. However, most purely agricultural experiments require to be observed on successive days rather than continuously through two successive periods. A most profitable use of part of the recitation time would be the discussion of "home projects" carried on under the instructor's supervision. Unfortunately there is little evidence that such work has been tried to any great extent.

It is not surprising to find that 81 schools report the subject as required and 63 report it as elective; for small schools have seldom worked out the problem of the elective or optional system. With a teaching force of only one or two teachers attempting to cover a four-year course, the set curriculum seems to offer the line of least resistance.

The relation of agriculture to the other studies in the curriculum is strikingly shown by the fact that 29 out of 136 schools report no other science preliminary to agriculture, 70 report one, 26 report two, and 11 report three. The same schools report the agriculture preceded by physical geography 72 times, by botany

33 times, by physiology 17 times, by physics 16 times, by chemistry 6 times, and by others 11 times. The above facts clearly show that current practice must radically change before agriculture can be presented either in a highly technical or in a synthetic manner. Besides such a procedure would be out of the question in many schools included above that have only a three-year curriculum. Another possibility that will probably meet with little favor with those under the domination of the colleges is the idea of such courses in physics and chemistry as are within the comprehension of high-school students of the second year, courses that are more phenomenal and less mathematical than the present conventional courses.

A fair measure of the efficiency of the instruction is furnished by the amount and character of experimental and observational work. Over one hundred schools reported doing practically all the experiments in the text or manual used. Half as many carried on additional experiments, while about the same number reported "a few" experiments, no laboratory work, or ignored the question. The slight preponderance of demonstrations over work by the pupils individually or in groups is natural, considering that agriculture is being introduced most rapidly into schools with small equipment. This supposition is borne out by the reports of 56 schools on expenditures for agricultural apparatus, 34 spending each \$25 or less. Eight schools spent nearly \$900 in all for gardens and other out-door work, and 50 spent over \$2,100 for in-door work. Gardens were reported without qualification by 28 schools, twice as many reported home gardens in connection with school work, a few carried on some irregular work and 160 either reported none or did not give data. We usually think of gardens carried on in connection with the work of the grades and in cities, but this work is done entirely by pupils in high schools and, for the most part, in the country or villages. It is evident that the purpose in the two cases is very different. The high-school pupils do not have to garden to see "how things grow," but do it to carry on definite scientific experiments.

Most of the textbooks used were intended by the authors

for use in the grades and have been used in the high schools for want of something better. The pupils themselves have been reported a number of times as regarding these texts as infantile. Fortunately three or four books have appeared rather recently that are better adapted to high-school use, the latest having been written for students of the upper classes with some preparation in science.

The efficiency of the instruction is necessarily dependent in a large degree upon the qualifications of the teacher. In a large number of instances the superintendent handles the subject either because his science teacher cannot, because he takes the odds and ends, or because he is the only man in the school. The last alternative is evidently the reason in almost two-thirds of the schools reporting. A few principals seem to be teaching it on account of training received in agricultural colleges. Assistants in only 11 high schools were reported as having had such preparation. A very large proportion of the teachers had had neither college science nor practical farm experience. Of 170 teachers reporting their qualifications, about 45 per cent had farm experience, almost 40 per cent had college science or agriculture, and a few others normal-school courses, while nearly 20 per cent claimed no fitness or failed to report. About one-half of the teachers are not college graduates, and almost a third are neither college nor normal-school graduates. These facts, when known, cannot but influence the action of the large number of colleges and universities at present showing a disposition to credit agriculture for entrance when the course pursued by the student shows evidence of being on a par with other acceptable science work.

Notwithstanding the large proportion of teachers who are superintendents or principals, only 10 per cent teach less than three classes besides the one in agriculture. About one-third are responsible for three or four other classes, and five reported from 15 to 18 other classes. A dozen spend seven to eight hours a day in the schoolroom. Naturally little time is left for trips to nearby fields, stock farms, or creameries.

Of the 170 teachers just mentioned, 120 are in Missouri,

Nebraska, and Ohio. The salaries are lowest in Missouri, where 90 per cent of the classes in agriculture are taught by executive officers, and highest in Ohio, with 85 per cent of the classes so taught. Nebraska pays a medium salary, though nearly half of the teachers of agriculture are women, and though three times as many women teach this branch as in the other two states combined. The average for the three states is about \$700, with an average deviation of about \$150. As many schools pay less than \$655 as pay more. This is nearly \$250 less than the salaries paid to 272 graduates of agricultural colleges from 1907 to 1909 inclusive. The demand for trained agriculturists to fill positions in colleges and experiment stations, in the state and federal agricultural service, in the rapidly increasing special schools, and in commercial lines, is sufficient to enable these graduates without experience to command a much higher salary than our present teachers with often several years of experience. The salaries paid trained agriculturists in more than forty general and technical high schools range from \$600 to \$2,000 a year. Twelve receive \$1,000 each, six receive \$1,200, and twelve others are paid the higher salaries. Probably eight of the \$1,000 men are principals, as are all but three of the remaining eighteen. The rural high school's only hope of securing a teacher for the agriculture lies in electing as principal an agricultural-college graduate who is willing to accept the place for a year or two to do his "practice teaching." Unless the temper of the rural taxpayer greatly changes, agricultural instruction in his high school must be conducted for many years to come by teachers whose only preparation, aside from some experience as a boy on a farm, or some study of natural sciences, must be picked up at random and in the summer schools.